

SEMESTER END EXAMINATION, MAY, 2024

Course Name: - B.Tech CSE
Paper Name: - Operating System

Semester:- IV
Paper Code: - TCS 401

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer.

Max Marks-70

समय- 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त-दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए।

अधिकतम अंक-70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries 3 mark. All questions are compulsory.
- Section B- Answer any 5 out of 7 given questions in maximum one hundred fifty (150) words. Each question carries 7 marks.
- Section C- Answer any 2 out of 3 given questions in maximum three hundred (300) words. Each question carries 10 marks.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड-अ में प्रत्येक प्रश्न तीन अंक का है। सभी प्रश्न अनिवार्य हैं।
- खण्ड-ब में सात प्रश्नों में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न सात अंक का है।
- खण्ड-स में तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर अधिकतम (250-300) शब्दों में दें। प्रत्येक प्रश्न 10 अंक का है।

Section - A (खण्ड-अ)

Objective Questions (वस्तुनिष्ठ प्रश्न)

5x3 =15

1. Answer all the following questions.

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) Which of the following mechanisms is a locking mechanism?

- a. Semaphore
- b. PCB
- c. Mutex ✓
- d. Binary Semaphore

ii) Banker's algorithm is used?

- a. To prevent deadlock ✓
- b. To deadlock recovery
- c. To solve the deadlock
- d. None of these

iii) What type of scheduling is round-robin scheduling?

- a. Linear data scheduling
- b. Non-linear data scheduling
- c. Preemptive scheduling ✓
- d. Non-preemptive scheduling

iv) Consider the following three processes in the FCFS.

Process ID.	Brust-time.	Arrival-time
P1	3	3
P2	6	6
P3	9	9

What is the average waiting time?

- 2
 - 3
 - 4
 - 5
- v) Which of the following "semaphore" can take the non-negative integer values?
- Binary Semaphore
 - Counting Semaphore
 - Real Semaphore
 - All of the these

Section – B (खण्ड-ब)

Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words.

5x7=35

निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

- Define the term preemptive and non-preemptive. Explain critical section problem. Also give a solution to critical section problem which satisfy the requirements.
- Define starvation in operating system. What is the need of swapping in OS? Explain any two classical problem of process synchronization.
- Describe semaphore and operation of semaphore. What are the usage of semaphore. What are the two methods of deadlock prevention strategies?
- What is synchronization in operating system? Explain types of scheduling. Describe necessary condition for deadlock.
- What is the concept of deadlock and race condition? Explain two Deadlock mechanism. Which algorithm is most widely used to avoid deadlock.
- Describe the fundamental model of IPC. Explain monolithic kernel and micro kernel. Name any two non-preemptive scheduling.
- Describe the role of memory management and page size in operating system? Explain memory management techniques.

Section - C (खण्ड-स)

Descriptive Questions (विवरणात्मक प्रश्न)

2x10=20

3. Answer any two of the following question in maximum 300 words.

निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

- i) Explain Paging in Operating System with help of proper explanation by giving example. Also differentiate between page fault and page replacement. Why paging algorithm is important?
- ii) What is disk management in operating system? Explain disk management techniques used in operating system. Describe the concept of Boot blocks and bad blocks.
- iii) Explain objectives of file management in operating system. Also describe the types of file management in operating system. How are file permission and access control managed?